Patent Claims

1. An optoelectronic sensor for demodulating a modulated photon flux (50) having
a semiconductor region (10),
at least two collecting zones (20, 22) present in the semiconductor region (10) and serving for collecting and tapping off minority carriers (11) generated when a modulated photon flux (50) penetrates into the semiconductor region (10), and
at least two control zones (32, 34) introduced in the semiconductor region (10) and serving for generating a drift field in a manner dependent on a control voltage that can be applied to the control zones (32, 34), the control zones (32, 34) being of the same doping type as the semiconductor region (10).

2. The optoelectronic sensor as claimed in claim 1, wherein
the semiconductor region (10) is situated above or in a semiconductor substrate (12), which is doped more highly than the semiconductor region (10).

3. The optoelectronic sensor as claimed in claim 1, wherein
the semiconductor region (10) is applied on a dielectric (12).

4. The optoelectronic sensor as claimed in one of claims 1 to 3,
wherein
the control zones (32, 34) are at a greater distance from the midpoint of the sensor than the collecting zones (20, 22).

5. The optoelectronic sensor as claimed in one of claims 1 to 4,
wherein
the semiconductor region (10) is p-doped.

6. The optoelectronic sensor as claimed in one of claims 1 to 5,
wherein
the collecting zones (20, 22) are diffused and doped inversely with respect to the semiconductor region (10).

7. The optoelectronic sensor as claimed in one of claims 1 to 5,
wherein
the collecting zones (20, 22) are produced by local charge transfers in the semiconductor region (10).

8. An optoelectronic sensor for demodulating a modulated photon flux (50) having
a semiconductor region (10),
at least two collecting zones (20, 22) present at a surface of the semiconductor region (10) and serving for collecting and tapping off minority carriers (11) generated when a modulated photon flux (50) penetrates into the semiconductor region (10), and
at least two capacitive elements (35, 36; 37, 38) for capacitively coupling in an AC voltage for generating a drift field in a manner dependent on the coupled-in AC voltage, the collecting zones (20, 22) being arranged between the capacitive elements (35, 36; 37, 38).

9. The optoelectronic sensor as claimed in claim 8,
wherein

the capacitive elements (35, 36) are capacitors or Schottky diodes.

10. The optoelectronic sensor as claimed in claim 8, wherein
the capacitive elements (37, 38) contain zones that are doped inversely with respect to the semiconductor region (10).

11. The optoelectronic sensor as claimed in one of claims 1 to 10,
wherein
the collecting zones (20, 22) are formed as Schottky diodes.

12. The optoelectronic sensor as claimed in one of claims 1 to 11,
wherein
in the semiconductor region (10), more than one collecting zone pair is embedded between two control zones (32, 34) or two capacitive elements (35, 36; 37, 38).

13. A measuring device in particular for 3D distance measurement having
at least one optoelectronic sensor as claimed in one of claims 1 to 12,
an optical transmitter for generating a modulated photon flux having a predetermined phase,
a device (60) for generating a control voltage, the phase of the control voltage being in a fixed relationship with the phase of the photon flux generated by the transmitter, and
an evaluation device (40, 42) assigned to the collecting zones (20, 22) and serving for determining the amplitude

and the phase of the modulated photon flux with respect to the phase of the control voltage.